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Diagnosis of vaginal discharge

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Vaginal discharge is a frequent symptom in women. It has been estimated that between 5 and 10 per cent. of women attending general practitioners complain of vaginal discharge and a considerable proportion of the patients seen in gynaecological and contraceptive clinics, as well as in departments of venereology, present with this symptom. There is evidence that the condition is frequently inadequately investigated and incorrectly treated. Accurate bacteriological diagnosis of the cause of the discharge is usually possible and has become increasingly important because of the specific remedies now available for treatment.

This paper describes an investigation into the causes of vaginal discharge in 300 consecutive women patients attending a busy department of venereology and considers some of the problems encountered during the investigation of their symptoms. With all of the patients in the series the principal complaint was of vaginal discharge. Many were referred to the department by their family doctors and some by gynaecologists and other consultants, several attended directly of their own accord, and some were the contacts of men already attending the department. The patients were, therefore, a selected group in the sense that they attended, or were referred to the department, because of the possibility that they might have a sexually transmitted disease.

Method

A detailed medical history was taken and a full physical examination was performed on all the patients. A Cusco bivalve speculum was placed in the vagina with the patient in the lithotomy position and specimens of secretions were obtained from the vagina, cervix, and urethra by means of bacteriologist's platinum loops. A cervical smear was also taken for cytological investigation. A bimanual pelvic examination, taking of blood for serological tests for syphilis, and examination of the urine for protein and sugar completed the clinical investigations.

A wet slide, consisting of a loopful of vaginal secretion mixed with a drop of normal saline on a clean microscope slide, was examined immediately under the darkground microscope for *Trichomonas vaginalis*.

Slides of the urethral and cervical secretions were stained with Gram's stain and examined immediately in the clinic. The cultures consisted of McLeod's chocolate agar medium for gonococci, the Feinberg-Whittington medium for *Trichomonas vaginalis*, and Sabouraud's medium for *Candida albicans*. In cases in which rectal tests were performed a modified Thayer-Martin culture medium was used.

Findings

Trichomonas vaginalis was the commonest cause of vaginal discharge and was found in 125 (41·6 per cent.) of the patients. *Candida albicans* was demonstrated in the vaginal tests from 102 (34 per cent.) of the women and, of these women, 54, or over half, were using a contraceptive pill. Gonococci were found in 95 (31·6 per cent.) of the women, and there was a frequent association of gonorrhoea and trichomonal vaginitis.

Non-specific cervicitis was diagnosed in 32 patients (11 per cent.). This diagnosis was made on clinical grounds, when evidence of cervicitis was found together with a mucopurulent cervical discharge, and on epidemiological grounds, when the male sexual partner was known to have non-specific urethritis.

Cervical erosions were considered to be the cause of the discharge in only eight patients. Foreign bodies were found in the vagina in eight women and were usually tampons or contraceptive devices, which had been forgotten by the user. The discharge cleared up rapidly in all cases when the foreign body was removed.

Benign cervical polyps were found in six cases and cervical carcinoma in five. In none of these women was the discharge bloodstained. In three patients the carcinoma was non-invasive when diagnosed, being of the carcinoma *in situ* type, and in two it was invasive.

Senile vaginitis was diagnosed in four post-menopausal women and the discharge disappeared satisfactorily after the use of local oestrogen cream to the vagina.

No cause for the vaginal discharge was found in thirty women (10 per cent.). In nearly half of these

cases the discharge ceased during the period of observation after advice about regular washing of the external genitalia with soap and water. In the remainder, despite repeated tests, no cause was found and the discharge continued throughout the 3-month follow-up period.

These findings are summarized in Table I.

TABLE I *Causes of vaginal discharge in* 300 *patients,* 74 *of them with more than one pathological condition*

Diagnosis	*No. of cases*
T. vaginalis	125
C. Albicans	102
N. gonorrhoea	95
Nonspecific cervicitis	32
Cervical erosion	8
Foreign body	8
Cervical polyp	6
Cervical carcinoma	5
Senile vaginitis	4
Undetermined	30
Total	415

More than one cause of discharge was found in 74 women. The commonest association was between gonorrhoea and trichomonal vaginitis. In 45 of the 95 women diagnosed as having gonorrhoea, *Trichomonas vaginalis* was also found in the vaginal secretions. The danger of giving empirical treatment with metronidazole to women with vaginal discharges, thought to be caused by trichomonads, needs no further comment.

Diagnosis

Every patient in the series had at least four pelvic examinations and the majority had six or more genital tests performed. They were all observed for at least 3 months.

Trichomonas vaginalis (Table II) was found at the first examination in 78·4 per cent. of the 125 patients eventually found to harbour the parasite, in 16 per cent. at the second examination, 4 per cent. at the third, and 1·6 per cent. at the fourth. In the majority of women it was demonstrated both by darkground microscopy and on culture, but in 5 per cent. it was only grown on culture. It was extremely rare for trichomonads to be found microscopically and not to be grown on culture.

TABLE II *Diagnosis of trichomonal vaginitis*

Examination	*Cases infected*	
	No.	*Per cent.*
First	98	78·4
Second	20	16·0
Third	5	4·0
Fourth	2	1·6
Total	125	100·0

Candida albicans (Table III) was found at the first examination in 75 per cent. of those so infected, in 15 per cent. at the second, and in 12 per cent. at the third. The fungus was demonstrated on culture alone in 30 per cent. of the cases. It was rare for it to be found on the stained microscope slide and not to be grown on culture.

TABLE III *Diagnosis of* C. albicans *infection*

Examination	*Cases infected*	
	No.	*Per cent.*
First	75	75
Second	15	15
Third	12	12
Total	102	100

Gonococci were found in Gram-stained smears from the cervix and urethra in only 67 (69 per cent.) of 95 consecutive cases of gonorrhoea in women (Table IV).

The organisms were only demonstrated microscopically in 50 per cent. of the cases at the first attendance, 12 per cent. at the second, 5 per cent. at the third, and in as many as 2 per cent. at the fourth. The microscopical examinations were carried out by experienced observers and the results re-emphasise the limitations of Gram-stained slides in the diagnosis of gonorrhoea in women and underline the importance of cultural tests.

During the period under consideration, cultures using direct inoculation on to McLeod's chocolate agar were yielding a high correlation of 95 per cent. between stained smears and cultures in men with urethral gonorrhoea. However, in women, gonococci were grown in only 66 per cent. of the cases so infected at the first examination, 20 per cent. at the second, 10 per cent. at the third, and 4 per cent. at the fourth (Table IV).

TABLE IV *Diagnosis of gonorrhoea in* 95 *women*

Examination	*Positive Gram-stained smears*		*Positive McLeod's chocolate agar culture*	
	No.	*Per cent.*	*No.*	*Per cent.*
First	48	50	63	66
Second	12	12	18	20
Third	5	5	9	10
Fourth	2	2	4	4
Total	67	69	95	100

Comment

These figures underline the fact that, even with a first-class cultural service, repeated examinations are necessary to establish the diagnosis of gonorrhoea in women. If it is so difficult to make the diagnosis, it follows that it is even more difficult to establish that cure has followed treatment, or to exclude the diagnosis in women who could be infected. When the results of both stained smears and cultures are considered together, over 33 per cent., or one-third, of the cases of gonorrhoea were not diagnosed at the first examination, and over 10 per cent., that is to say 1 in 10, of the cases were only diagnosed at the third or fourth examination.

Accurate diagnosis of the cause of vaginal discharge is of great importance, if modern scientific treatment is to be used intelligently and efficiently. The days of empirical treatment of this common condition are past, and it is now possible to make an exact bacteriological diagnosis in a great majority of cases. However, if the cause is to be determined in every patient before treatment is given, thorough and careful investigation is essential. Our experience suggests that this must include a detailed history and physical examination followed by bacteriological tests in the form of smears and cultures taken from the vagina, cervix, and urethra, and, in some cases, from the rectum. These tests must include reliable methods of detecting gonococci and other organisms such as *Trichomonas vaginalis,* and *Candida albicans*. Unfortunately there are no satisfactory routine tests available for demonstrating the presence of viruses in the genital tract. Cervical cytology, a bimanual pelvic examination, tests of the urine for protein and sugar, and serological tests for syphilis should be carried out in all cases. Repeated tests are essential before a bacteriological cause can be excluded and this is particularly important with regard to gonorrhoea. The diagnosis of this disease cannot be excluded until at least three negative tests have been obtained, and ideally four or more separate tests should be carried out before the patient is told that she is free from infection. In the follow-up of women treated for gonorrhoea repeated, careful testing is essential before cure can be presumed to have occurred.

Summary

300 consecutive cases in women complaining of vaginal discharge have been investigated. The commonest causes of vaginal discharge were *Trichomonas vaginalis, Candida albicans,* and *Neisseria gonorrhoeae.* Trichomonal vaginitis and gonorrhoea frequently occurred together in the same patient. Repeated bacteriological tests were required to demonstrate the cause of the discharge in many of the patients, especially those with gonorrhoea, and cultures were found to give more positive results than stained smears. Better methods of diagnosis are needed, and, until immuno-fluorescence techniques and serological tests are improved, it is recommended that all women with vaginal discharge should have at least three sets of bacteriological tests performed before they are considered to be free from sexually transmitted disease.

Le diagnostic de la leucorrhée

SOMMAIRE

Une série continue de 300 femmes se plaignant de leucorrhée a été étudiée. Les causes les plus communes de celle-ci fut *Trichomonas vaginalis, Candida albicans,* et *Neisseria gonorrhoeae.* La vaginite à trichomonas et la gonococcie se rencontrent souvent simultanément chez une même malade. Chez beaucoup de malades, des examens bactériologiques répétés furent nécessaires pour trouver la cause de l'écoulement, spécialement en cas de gonococcie, et l'on constata que les cultures donnaient des résultats plus souvent positifs que les colorations de lames. De meilleures méthodes de diagnostic sont nécessaires et, jusqu'à ce que les techniques d'immunofluorescence et les tests sérologiques soient perfectionnés, il est recommandé que toutes les femmes atteintes de leucorrhée soient l'objet au moins de trois ensembles d'investigations bactériologiques avant d'être considérées comme indemmes de maladies transmises par contact sexuel.